RCMP·GRC

ROYAL CANADIAN MOUNTED POLICE • GENDARMERIE ROYALE DU CANADA

THE NATIONAL DNA DATA BANK OF CANADA

ANNUAL REPORT 2013/2014

1989 DNA: then and now 2014

Royal Canadian Mounted Police / Gendarmerie royale du Canada

Canada

Cover: The 2013/14 NDDB Annual Report features the evolution of forensic DNA analysis since it was first used by the RCMP in a criminal investigation in 1989.

ANY INQUIRIES REGARDING THE CONTENT OF THIS REPORT OR REQUESTS FOR ADDITIONAL COPIES SHOULD BE ADDRESSED TO:

NATIONAL DNA DATA BANK OF CANADA

Forensic Science and Identification Services,
Royal Canadian Mounted Police

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www.rcmp-grc.gc.ca/nddb-bndg

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MESSAGE FROM THE COMMISSIONER

Royal Canadian Mounted Police

This past year has been another period of remarkable accomplishment and innovation for the National DNA Data Bank (NDDB). In April 2014, the Data Bank will be introducing a new DNA sample tracking process integrated with advanced technologies that will ensure the Data Bank keeps pace with the ever-changing scientific landscape.

From June 2000 when the NDDB opened for business until the end of the 2013 fiscal year, the Data Bank provided investigative leads in more than 33,000 cases, matching DNA profiles from convicted offenders to DNA profiles developed from biological evidence found at crime scenes.

Every day, the NDDB helps solve cases ranging from simple break-ins to complex, high-profile murders and sexual assaults. Some cases are recent while others are decades old. Helping to resolve cold cases is one of the most impressive things the NDDB does. While the passage of time may lead some criminals to think they've evaded justice, the evolution of technology means no serious investigation is ever concluded until the perpetrator is caught. Science is making it increasingly difficult to get away with any offence.

Over the years, the NDDB has grown into a world-class forensic DNA data bank. It continues to innovate by developing new processes and adopting advanced technologies that set the bar ever higher. I am extremely proud of what the NDDB and its many law enforcement, justice and forensic laboratory partners have accomplished in 2013. After reading this year's Annual Report, I expect you will share my enthusiasm.

Bob Paulson
Commissioner

QUICK FACTS

382,906
DNA Profiles Contained in the NDDB[1]

288,660
DNA Profiles Contained in the Convicted Offenders Index

94,246
DNA Profiles Contained in the Crime Scene Index

24,492
Convicted Offender Samples Received in 2013/14[2]

10,483
Increase in Crime Scene Index Profiles in 2013/14

3,607
Offender Hits (Convicted Offender to Crime Scene) in 2013/14

314
Forensic Hits (Crime Scene to Crime Scene) in 2013/14

3,921
Investigations Assisted by the NDDB in 2013/14

30,110
Offender Hits since June 30, 2000

3,488
Forensic Hits since June 30, 2000

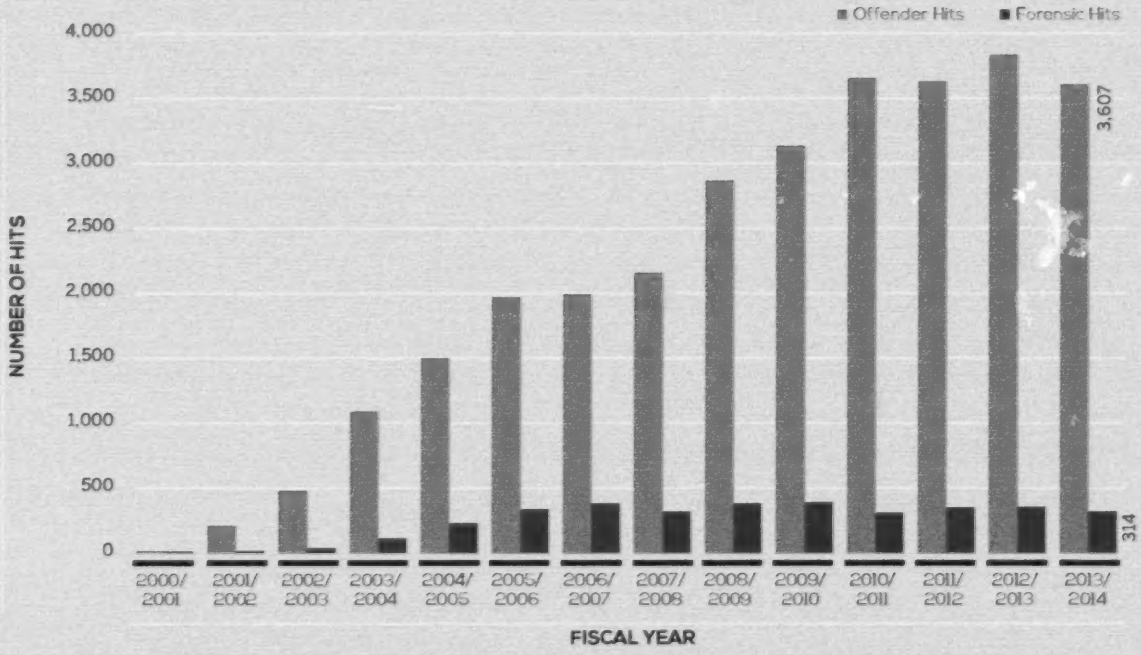
33,598
Investigations Assisted by the NDDB since June 30, 2000

1 If no date range is specified the data refers to the period from June 30, 2000 through March 31, 2014

2 2013/14 refers to the NDDB's fiscal year from April 1, 2013 through March 31, 2014

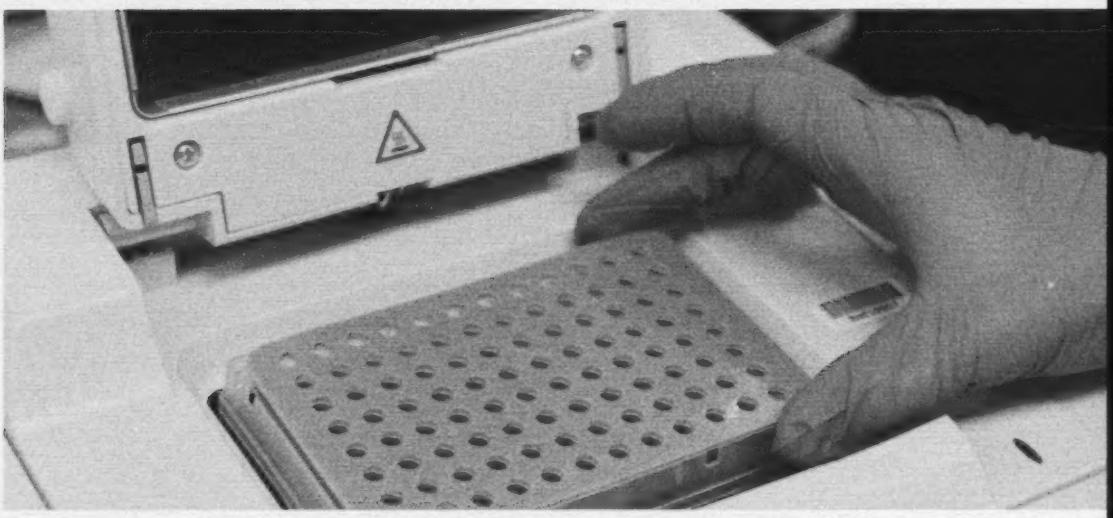
As more DNA profiles are entered into the NDDB, the number of days required for the Offender Hits to increase by a factor of 1,000 has decreased. It took more than three years for the NDDB to reach its first milestone of 1,000 hits. Since 2010/11 that same 1,000 increment milestone has been achieved on average in less than three months.

OFFENDER AND FORENSIC HITS



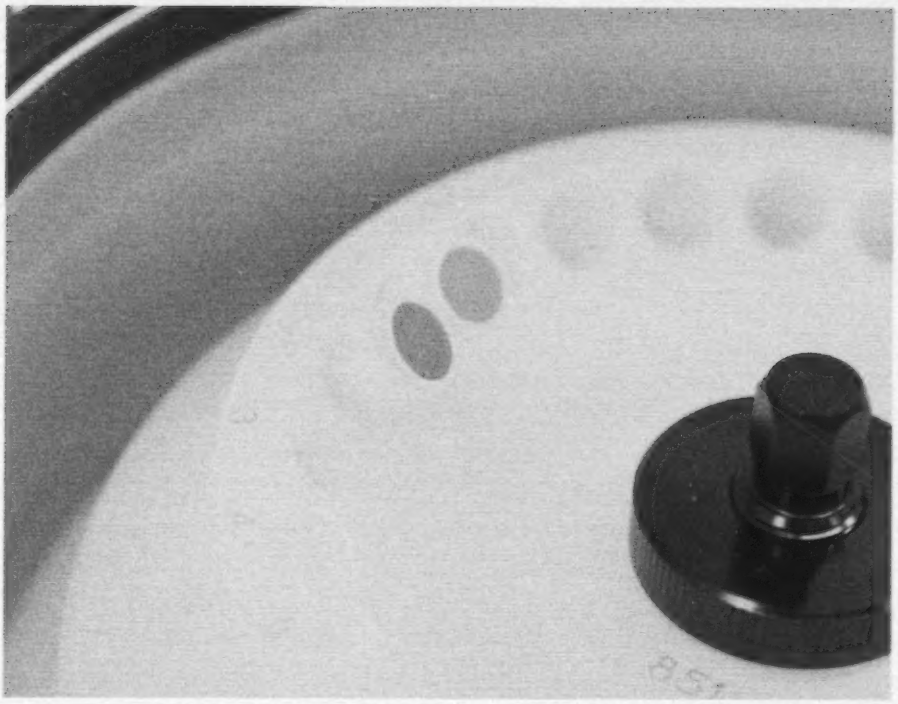
THE NATIONAL DNA DATA BANK

The RCMP is the steward of the NDDB on behalf of the Government of Canada. It operates the NDDB for the benefit of the entire law enforcement community within Canada.



Confirming the Government of Canada's commitment to combat crime, especially violent crime, Bill C-3, the *DNA Identification Act* (S.C. 1998 c. 37) received Royal Assent on December 10, 1998. The RCMP built the NDDB after Bill C-3 received Royal Assent.

In 2000, Parliament enacted Bill S-10, *An Act to Amend the National Defence Act, the DNA Identification Act and the Criminal Code* (S.C. 2000, c. 10). The NDDB became operational on June 30, 2000 when Bills C-3 and S-10 were proclaimed.



The NDDB improves the administration of justice by contributing to the early identification of those who commit serious crimes;

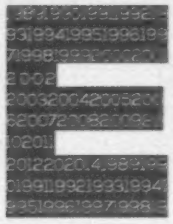
- Linking crimes where there are no suspects;
- Helping to identify suspects;
- Eliminating suspects where there is no match between crime scene DNA and profiles in the NDDB; and
- Determining whether a serial offender is involved.

The NDDB conducts the following comparisons to assist in criminal investigations:

- DNA profiles developed from crime scene samples are compared against DNA profiles from other crime scenes. Matches identify potential links between different crimes, which helps investigators look for other commonalities that may assist with solving the crimes.
- DNA profiles developed from crime scene samples are compared against convicted offender DNA profiles to associate an offender with a particular crime.

See Appendix B for a detailed chronology of DNA legislation in Canada.

THE WORKING SCIENCE



The NDDB comprises two indices: the Convicted Offenders Index and the Crime Scene Index.

THE CONVICTED OFFENDERS INDEX (COI)

Biological samples collected from convicted offenders are processed by the NDDB and the resulting DNA profiles are entered into the COI.

The COI is the electronic DNA profile database developed from biological samples collected from:

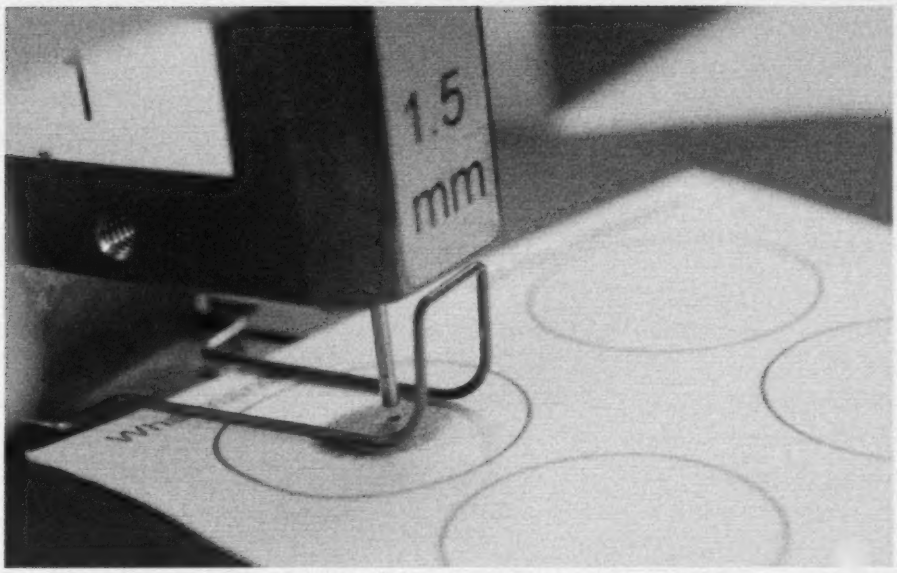
- Offenders convicted of designated primary and secondary offences (see Appendix A) identified in section 487.04 of the *Criminal Code*; and
- Offenders who meet the retroactivity criteria in section 487.055 of the *Criminal Code*. In general terms, this applies to those convicted of certain serious offences who were already serving a sentence or who had been declared a dangerous offender or a dangerous sexual offender before June 30, 2000 when the *DNA Identification Act* was proclaimed. (See Key Statistics explanatory notes on page 20 for a complete description of retroactive provisions).

Biological samples from convicted offenders are collected by:

- A peace officer who is able, by virtue of training or experience, to take samples of bodily substances from the person, by means of the procedures described in subsection 487.06 of the *Criminal Code*; or
- Another person who is able, by virtue of training or experience, to take under the direction of a peace officer, samples of bodily substances from the person, by means of those procedures.

These biological samples are obtained using NDDB-specific sample kits designed for the collection of the following bodily substances:

- **Blood:** The sample is obtained by using a sterile lancet to prick the fingertip.
- **Buccal:** The inside of the mouth is rubbed with a foam applicator to obtain skin cells.
- **Hair:** Six to eight hairs are pulled out with the root sheath attached.



Convicted offender biological samples are collected and submitted to the NDDB to be processed into DNA profiles. Robotics technology, coupled with a sophisticated Sample Tracking and Control System (STaCS™), allows NDDB analysts to rapidly and efficiently process samples while ensuring overall data security and providing quality control throughout the DNA analytical process. Depending on the technology used, the DNA profiles generated are the result of 14 to 18 specific DNA markers that are tested to produce profiles which show a high degree of variability between individuals (with the exception of identical twins).

DNA profiles are loaded into the Combined DNA Index System (CODIS), a software package that stores and compares the profiles. CODIS was developed by the Federal Bureau of Investigation and the U.S. Department of Justice and is provided to the NDDB at no cost. The CODIS software is a universally accepted tool for forensic laboratories, which allows the NDDB to compare DNA profile information using a standard, secure format.

As of March 31, 2014, the COI contained 288,660 DNA profiles.

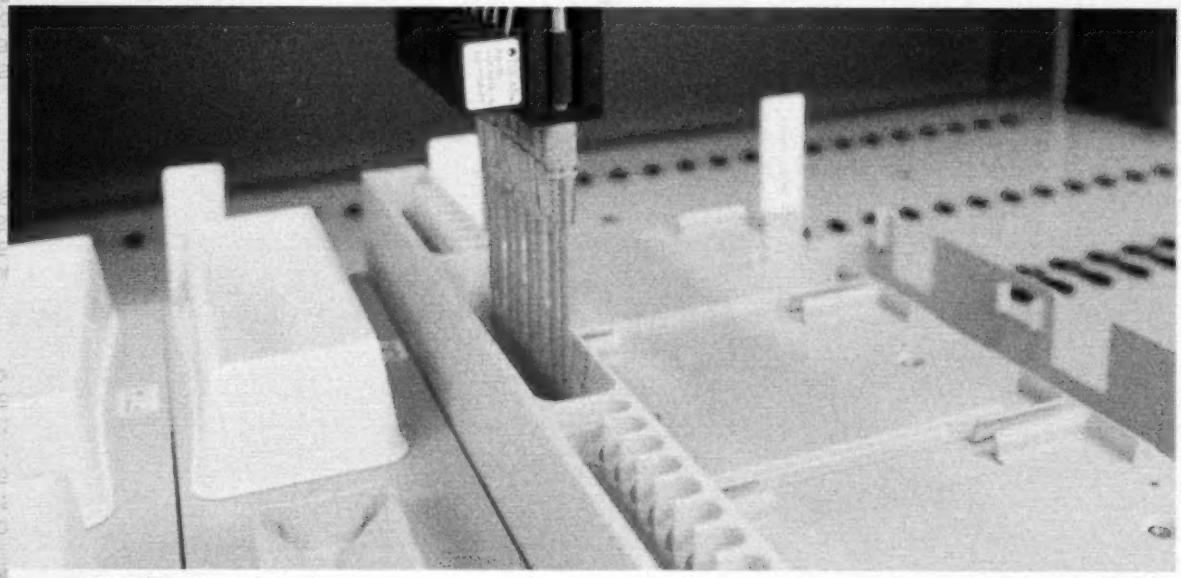
THE CRIME SCENE INDEX (CSI)

The CSI is a separate electronic database composed of DNA profiles obtained from crime scene investigations of the same designated offences as the COI. Exhibits containing biological evidence are collected by investigators and submitted to a forensic laboratory for examination and development of DNA profiles. The following forensic laboratory systems are authorized to upload profiles using CODIS into the CSI:

- The RCMP Forensic Science and Identification Services (sites in Halifax, Ottawa, Edmonton and Vancouver);
- The Centre of Forensic Sciences in Toronto and Sault Ste. Marie; and
- The Laboratoire de sciences judiciaires et de médecine légale in Montréal.

The NDDB retains the electronic DNA profile information as well as basic details such as the date, location of the submitting laboratory and a unique number identifier that allows information to be compared by the submitting laboratory in the event of a future match.

As of March 31, 2014, the Crime Scene Index contained 94,246 DNA profiles.



PRIVACY OF INFORMATION

The NDDB adheres strictly to the *DNA Identification Act*, which balances privacy rights with the need for police officers to identify suspects. Stringent procedures governing the handling of biological samples and resulting DNA profiles ensure that the privacy rights of individuals are protected.

It is important to note that convicted offender samples are identified simply by a bar code number and that crime scene samples are identified by a unique number identifier. In fact, the donor identity of a convicted offender is separated from the genetic information when the sample arrives at the NDDB. The bar code is the only link between personal information, the biological sample and the DNA profile. The personal information is protected information that is not accessible by NDDB staff, and is kept in a separate registry by the RCMP's Canadian Criminal Real Time Identification Services.

The *DNA Identification Act* makes it clear that the NDDB profiles can only be used for law enforcement purposes. The NDDB does not share the DNA profiles with anyone other than law enforcement agencies. The 14 to 18 specific markers comprising the DNA profile are considered anonymous and, other than gender, do not provide specific medical or physical information about the donor. The genetic regions chosen by the NDDB are the same regions of genetic variation used throughout the United States and in many other countries conducting forensic DNA analysis.

INTERNATIONAL PARTICIPATION

The NDDB shares DNA information through an international agreement with INTERPOL, approved by the Government of Canada, which limits its use to the investigation and prosecution of criminal offences. Since April 25, 2002 (date of signed International Agreement), the NDDB has received 1,137 incoming international requests to search its indices—the Convicted Offenders Index and the Crime Scene Index—resulting in 2 Offender Hits and 3 Forensic Hits. The NDDB has sent out 196 international search requests for DNA profiles developed from crime scene samples, resulting in 2 Offender Hits and 1 Forensic Hit.

PROCESS FOR REPORTING A MATCH

NDDB processes biological samples from convicted offenders and uploads the resulting DNA profiles into the Convicted Offenders Index.

Forensic laboratories process biological samples left at crime scenes and upload the resulting DNA profiles into the Crime Scene Index of the NDDB.

NDDB runs a search between the Crime Scene Index and the Convicted Offenders Index.

Match between a convicted offender's DNA profile and a crime scene DNA profile.

Bar code, laboratory identifier and CODIS identifier are brought to Canadian Police Services Information Centre (CPSIC).

CPSIC forwards the convicted offender data to the forensic laboratory.

Forensic laboratory passes the convicted offender identity information to the investigator.

PROCESS FOR CONFIRMING A MATCH

The investigator assesses the case evidence to determine if further investigation of the suspect is required.

If evidence of a match between the convicted offender and the crime scene profile is required for court purposes, the investigator must apply to a provincial court judge for a DNA warrant. If the warrant is ordered, a biological sample can be collected from the suspect under that authority.

The biological sample is submitted to a forensic laboratory for analysis. The laboratory compares the suspect's DNA profile to that of the crime scene evidence.

The forensic laboratory issues a report confirming a match between the suspect's DNA profile and that of the crime scene evidence.

Based on the laboratory report and other investigative information, the investigator can consider if charges should be laid or recommended against the suspect.

DNA: then and now

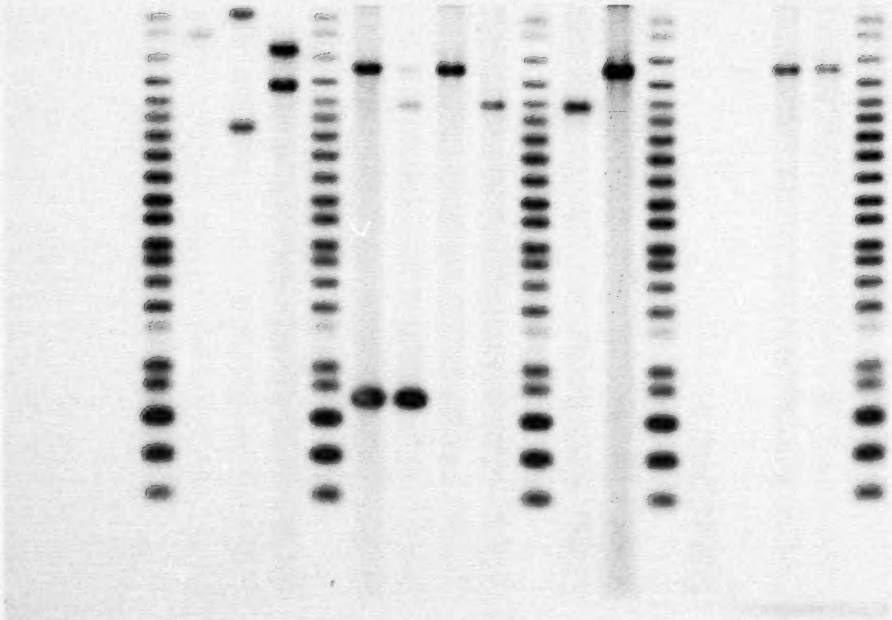
In early April 1989, the RCMP first used DNA analysis during the investigation of a sexual assault in Ottawa, Ontario. The victim visually identified her assailant but the suspect denied any involvement. DNA analysis assisted the investigation and supported the allegation that the suspect was the perpetrator. Mid-trial, after the DNA evidence was presented, the suspect changed his plea to guilty.

In the 1980s, when forensic DNA analysis was still a relatively unknown science, questions were raised about its ability to identify individuals exactly. How could anything be so accurate? At the time, only fingerprints were in the same category.

DNA, and to some extent many aspects of forensic science, were unknown to the general public and were often shrouded in a sense of mystery outside the normal realm of traditional science. It was a science practiced within a closed system by an exclusive set of professionals who had specific but significant experience using science to address questions before the courts. When forensic DNA analysis was first used, it was labour intensive and time consuming. Twenty five years later, due to technological advances and a better understanding of the DNA itself, a much wider field of scientists can now develop quality-assured DNA profiles quickly, often using the most challenging biological samples, such as those derived from degraded evidence or composed of more than one biological donor. What once seemed like an artistic scientific endeavor to the general public, one that took months to produce results, can now be done in a matter of days. In the future, it will take only hours to produce results using more automated and universally accepted technology. A blood sample the size of a quarter used to be needed to develop a DNA profile; today, a sample of approximately 40 blood cells, or roughly ten percent of what would fit on the head of a pin, is all that's required to obtain a result that can be used as evidence. What began as a specialized test that could only be performed by a small, well-trained group of specialists is now universally used by many scientists with enduring reliability.

Courts used to be doubtful of DNA evidence but now routinely expect it. One of the biggest problems is managing expectations – not every crime scene generates biological evidence.

Forensic science, including DNA, was once very reactive. Today, DNA is used proactively because key results can be obtained so quickly that they can help focus the direction of an investigation. In the investigative process, DNA has moved from the back of the line to the front.



Autoradiogram showing DNA profiles developed by the RCMP forensic laboratory in 1993 using Restriction Fragment Length Polymorphism (RFLP) technology.

DNA analysis has always pushed the envelope with respect to overcoming practical technological and biological limitations. Today, more information is being obtained faster than ever before and from smaller samples without compromising quality.

One thing has not changed: scientists are not magicians. They work in close collaboration with investigators as part of a forensic team. Since each investigation begins with the careful collection of evidence, experienced crime scene investigators are crucial to the process of obtaining successful DNA results. The scientists who develop DNA profiles will always work in close partnership with forensic investigators.

EMERGING TRENDS

The work that was once done by a small group of professionals in defined laboratory settings will, thanks to technological progress, eventually be used on the front lines at crime scenes. Selecting the best evidence first remains an important strategy that must work hand in hand with technology.

The application of forensic science as close as possible to the front end of an investigation helps to focus the scope of the investigation from the very start. This serves the police more effectively and ensures that justice is carried out in a manner that not only protects the innocent, but also helps to identify as quickly as possible those who have committed crimes.

The evolution of forensic DNA parallels science in general in that it is limited only by imagination, innovation and dedication. What once was impossible now seems routine.

SUCCESS STORIES

By March 31, 2014, the NDDB had registered its 30, 110th Offender Hit, the term used to indicate a match between crime scene DNA and the DNA profile of a convicted offender registered in the Data Bank. The following are just a few of the success stories highlighted by the media and police agencies in which the NDDB played a significant role.

DNA ON AIR BAG LEADS POLICE TO DANGEROUS DRIVER

One night in 2013, in Cambridge, Ontario, the driver of a car traveling at approximately 100 km/h tried to pass a transport truck on the wrong side of road. He crashed into the truck, embedding the car under the truck's trailer. During the collision, the car's air bags deployed. The driver of the car took off on foot, leaving behind an injured woman in the passenger seat. She told police that she had just met the man in a bar and knew only his first name. Police tracked the man down and arrested him after an analysis of the driver's side air bag turned up DNA that matched a profile in the National DNA Data Bank. The man had a long criminal record, including several previous convictions, and his DNA had already been entered in the Convicted Offenders Index (COI). In June 2013, the man was convicted of Dangerous Operation of a Motor Vehicle, sentenced to one year in prison and banned from driving for life.

DNA EVIDENCE CORNERS HOME INVADER

In 2012, in Saskatoon, Saskatchewan, two masked men forced their way into a home around 1am and demanded drugs and cash from the residents, a young man and woman, who later told police that one of the invaders had been carrying a collapsible baton, the other, a machete. The male victim was held in the living room while the young woman locked herself in a bedroom. The two men fled after the woman told them she had called the police. When police arrived, the victims gave descriptions of the suspects, indicating that one of the men had been wearing a black neck warmer. Police used dogs to conduct a search and found the neck warmer. They also noted a distinct shoe print in the snow that matched a shoe print found in the home. The DNA profile developed from the neck warmer matched the DNA of one of the perpetrators, who was already registered in the National DNA Data Bank as a result of a previous conviction. The man was later arrested and his shoe was found to match the prints left at the scene. He accepted responsibility for the home invasion and indicated that his accomplice that night had since died. In 2013, he was sentenced to four years in prison for the home invasion.

DNA HELPS CONVICT MAN OF THREE VIOLENT SEX ATTACKS

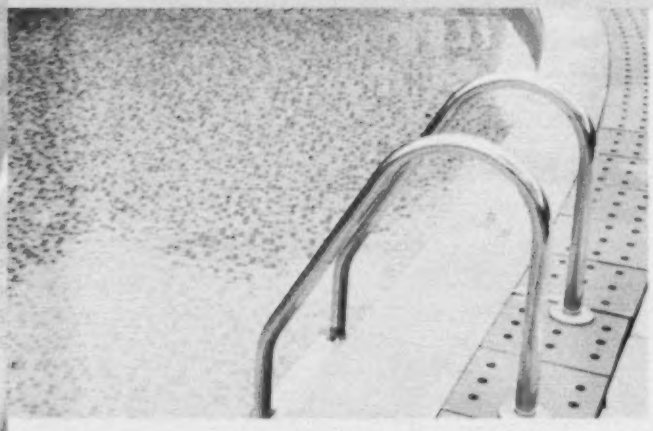
In 2004, in Edmonton, Alberta, a woman working as a prostitute was picked up by a man and driven to a field where he choked and sexually assaulted her. Another woman testified that the same man took her to an industrial area where he sexually assaulted her in his pickup truck. In December 2004, a third sex assault victim was found walking on the side of an Edmonton highway in the early morning hours without a winter coat or shoes. The police officer who found her said she was very upset and had noticeable bruising on both sides of her neck. She had no idea what had happened except that she had woken up in a field. Seven years later, another Edmonton area prostitute was picked up by a man who took her to his home where he punched her, choked her twice then sexually assaulted her. DNA from the attack was found and linked to the trio of 2004 sex assaults through the National DNA Data Bank. A suspect was arrested and police used a warrant to obtain a sample of his DNA, which was then matched to the 2004 sex attacks. In 2013, the man was found guilty of numerous offences, including sexual assault and kidnapping.

The National DNA Databank is an extremely powerful tool for police investigators. In this case, it allowed multiple unsolved sex crimes to be solved and facilitated the Prosecution in seeking an appropriate sentence for these crimes.

Constable James Kirkpatrick
RCMP K DIVISION INSET

DNA USED TO CONVICT SEX-TRADE WORKER OF KILLING CLIENT

In 2010, a man picked up a prostitute in downtown Calgary and took her to his home where he paid her for sex. When he later asked her to perform an additional sex act, she became angry and stabbed him fatally. His partially naked body was later discovered by his wife when she returned home. In 2005, the prostitute had assaulted a Peace Officer, which resulted in her DNA being entered into the National DNA Data Bank's Convicted Offenders Index (COI). She was charged with the Calgary killing when her DNA was linked to material found under the dead man's fingernails. In June 2013, a jury rejected her self-defense plea and found her guilty of second-degree murder. She received a mandatory life sentence with no chance of parole for at least 14 years.



Without the National DNA Data Bank, our investigation wouldn't have concluded as quickly as it did. The risk of another assault was so high that we needed evidence to arrest the suspect without delay so we could prevent more attacks.

Commandant B. Barabé
Responsable des enquêtes Région Est
Service de police de la Ville de Montréal

RAPIST ATTEMPTS TO ERASE DNA BY FORCING VICTIM TO SWIM

In 2010, in Montreal, Quebec, a man jumped out of the bushes near a secluded path and attacked a young woman. He covered her face with her sweater so she couldn't see him, then sexually assaulted her. Before setting her free, he told her they had to wash off evidence of his DNA. They found a swimming pool where he forced her to wade into the water up to her waist. He then released her and the woman went home and called the police. Investigators knew there would be little chance of collecting DNA evidence after the forced swimming. Fortunately, since the victim had only been submerged up to her waist, the police were able to collect a sample of her attacker's saliva from her upper body. A DNA profile was developed and, because the man was already in the National DNA Data Bank as a result of a conviction for a previous sexual assault, he was promptly arrested. Since the young woman hadn't seen his face, she was unable to identify him on sight. Without DNA evidence, he never would have been arrested. In 2012, the man pleaded guilty to two counts of sexual assault and uttering a death threat.

DNA EVIDENCE GIVES RAPE VICTIM CLOSURE AFTER 19 YEARS

In 1994, in Napanee, Ontario, a 16-year old girl was approached by a stranger as she walked along a quiet residential street. He grabbed her and forced her into a backyard where he sexually assaulted her three times. The case went unsolved for more than a decade until crime scene DNA was matched to a man whose DNA had been previously entered into the NDDB's COI following conviction for a 2006 sexual assault. He was arrested and charged in 2009 and in 2013 a jury convicted the man of kidnapping, sexual assault and forcible confinement.

DNA HELPS NAB MANSLAUGHTER SUSPECT

In 2012 in Edmonton, Alberta, a man who was drinking with a group of homeless people in a downtown parking lot pulled a knife and stabbed another man after a fight broke out. He also stabbed one of the female members of the group when she attempted to intervene. The attacker then fled the scene on his bicycle. The homeless man later died in hospital of his injuries but the woman survived. The attacker was caught nearly two months later when a DNA profile developed from one of the beer cans he had left at the scene was found to match a DNA profile already registered in the National DNA Data Bank. This evidence, combined with help from local small businesses owners, inner-city social assistance agencies and witness statements, helped police track down the suspect. In 2014, he pleaded guilty to manslaughter.

Without the assistance of the National DNA Data Bank, this particular case might have remained unsolved. The Data Bank was instrumental in identifying the accused and providing police with an investigative starting point, which subsequently led to the accused being charged and convicted. Equally important, it provided the victim with closure.

Detective/Constable Jennifer Shaw
Napanee Detachment, Ontario Provincial Police

NATIONAL DNA DATA BANK 2013/2014 ANNUAL REPORT: ADVISORY COMMITTEE

Created fourteen years ago through legislation, the National DNA Data Bank (NDDB) Advisory Committee reports to the Commissioner of the RCMP on matters related to the Data Bank's efficient and effective operation. The Committee also advises the Commissioner on a diverse range of issues pertaining to DNA ethics, scientific advancements and legislative changes. The eight members of the Advisory Committee are appointed by the Minister of Public Safety Canada and collectively provide a wealth of experience in law, science, privacy, ethics and law enforcement.

Since its inception in June 2000, the NDDB has proven to be an essential investigative tool, helping members of the law enforcement community solve current and cold-case crimes. While DNA evidence used to be considered unusual, time and reliability have made it essential and often expected in court proceedings. The NDDB Advisory Committee takes great pride in the Data Bank's remarkable success and acknowledges the critical role it plays in maintaining the balance between public safety and individual privacy rights.

Now as always, the NDDB Advisory Committee is dedicated to working with investigators, forensic laboratory scientists, partners and stakeholders to address challenges as they arise. Whenever appropriate, we will evaluate and recommend new technologies to help ensure that Canada's NDDB continues developing as a vital resource for investigators and prosecutors. Last year, the NDDB surpassed a remarkable milestone, registering its 30,000th convicted offender to crime scene sample DNA hit since operations began in 2000. Significant technological and information management system changes are about to be introduced to the NDDB's workflow, to further enhance the NDDB's ability to differentiate among individuals and setting the foundation for additional technological improvements in the years ahead.

In closing, I would like to take this opportunity to welcome Derrill Prevett, Q.C., the most recent appointment to the National DNA Data Bank Advisory Committee. Over the course of his extensive and accomplished legal career, he has focused on the significance of DNA evidence in court proceedings. From 2002 until 2007, he served as a member of the prosecution team in the trial of Robert William Pickton. I am certain he will bring a valuable new perspective to our group.

Garry Loeppky, O.O.M.
Deputy Commissioner (retired),
Chairperson

National DNA Data Bank
Advisory Committee

NATIONAL DNA DATA BANK

ADVISORY COMMITTEE MEMBERS

GARRY LOEPPKY

O.O.M. Garry Loeppky, D/Commr. (Rtd), served with the Royal Canadian Mounted police for 34 years. Throughout his career, D/Commr. Loeppky (Rtd) was responsible for coordinating and leading major investigations on both a domestic and international level. He worked with numerous foreign law enforcement organizations and has lectured in a number of countries including Canada, Australia, United States, and Europe.

CHANTAL BERNIER

Assistant Commissioner, Office of the Privacy Commissioner of Canada. Ms. Bernier was appointed by Order-in-Council as Assistant Privacy Commissioner (Privacy Act) on December 8, 2008 and was appointed in February 2009 member of the National DNA Data Bank Advisory Committee.

DR. FREDERICK R. BIEBER

Canadian-born Associate Professor of Pathology in the Faculty of Medicine at Harvard University, Boston, Massachusetts. Dr. Bieber is a medical geneticist and a specialist in bio-medical ethics.

GISÈLE CÔTÉ-HARPER

O.C., Q.C., graduate of Harvard Law School and currently a Barrister and Emeritus Professor at the Faculty of Law, Université Laval. Mme Côté-Harper is recognized nationally and internationally as a legal expert on human rights issues.

DR. WILLIAM S. DAVIDSON

Medical Genetics Specialist and Professor of Molecular Biology and Biochemistry, Simon Fraser University (Burnaby, B.C.). Dr. Davidson has published widely in the areas of molecular evolution, population genetics, genomics and human genetics.

DR. RON FOURNEY

O.O.M., Director, Science and Strategic Partnerships, Forensic Science and Identification Services, RCMP. Dr. Fourney is a research scientist and founding member of the RCMP DNA program. He has been instrumental in the development and implementation of forensic DNA typing for Canada.

DR. ANJALI MAZUMDER

Dr. Mazumder holds a Doctorate in Statistics from the University of Oxford and is a Research Fellow in the Department of Statistics at the University of Warwick. Dr. Mazumder has published widely in the fields of forensic DNA identification and value of evidence analysis using probabilistic expert systems and best practices in forensic science.

DERRILL PREVETT

J.D. (University of British Columbia), with 37 years of legal experience. Many of his criminal cases involved forensic evidence, particularly forensic DNA analysis. From 2002 until 2007, Mr. Prevett was a key member of the prosecution team for the trial of Robert William Pickton. He is internationally recognized as a legal expert on DNA evidence. He has lectured at various professional venues in Canada and abroad including the Justice Institute of B.C., Vancouver Island University, The University of Victoria, Osgoode Hall, the Canadian Society of Forensic Science and the International Association of Forensic Sciences.

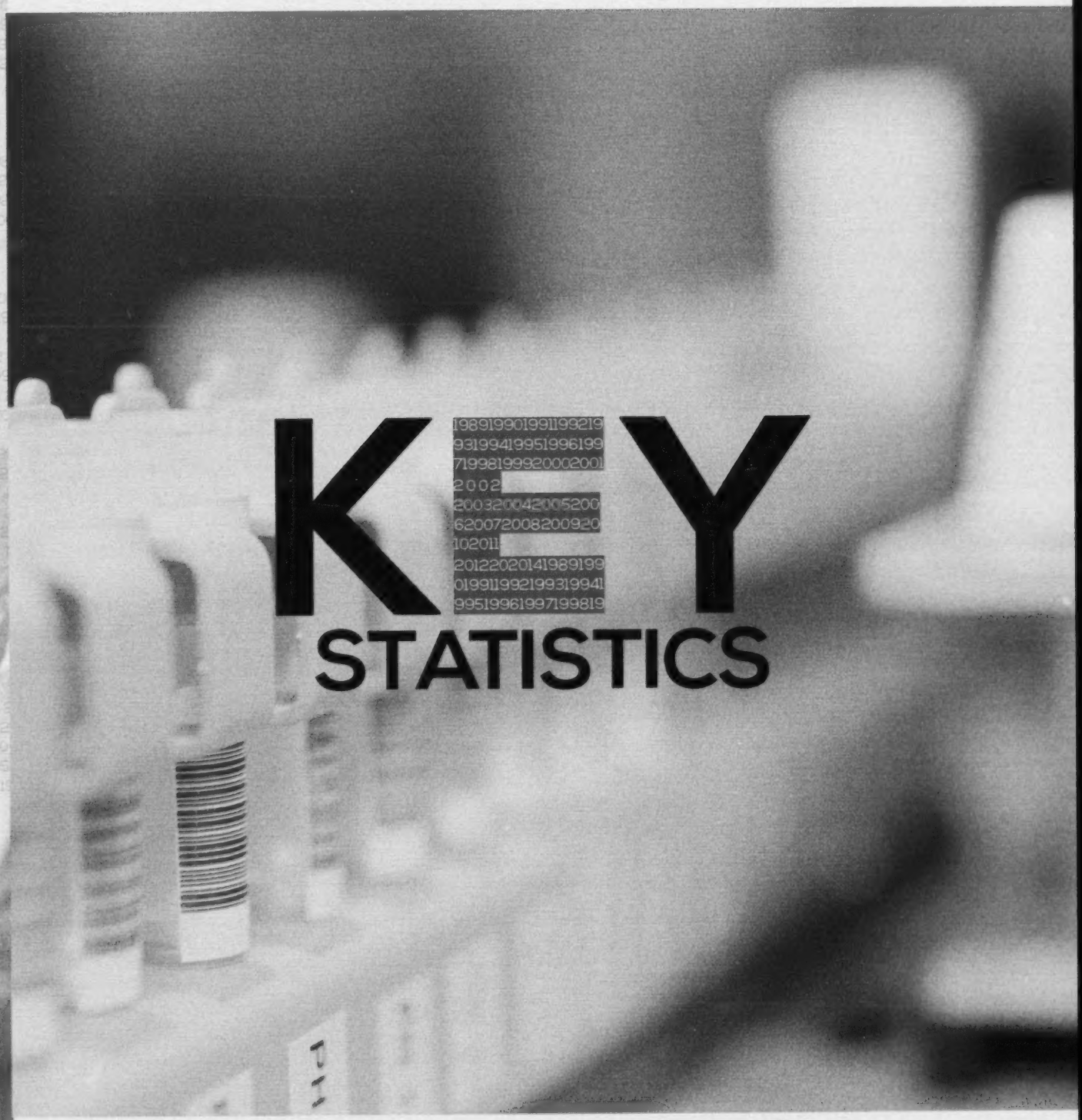

KEY
STATISTICS

TABLE 1 – CASES ASSISTED BY THE NDDB

Breaking and Enter	11,221
Sexual Offence	3,671
Robbery	3,385
Assault	2,321
Homicide	2,108
Attempted Murder	668
Other	6,736
TOTAL	**30,110**

TABLE 2 – MATCH INVENTORY REPORT

Offender Hit (Crime Scene Index to Convicted Offenders Index)	30,110
Forensic Hit (Crime Scene Index to Crime Scene Index)	3,488
Offender Duplicate (Two samples taken from the same person)	13,015
Identical DNA Profiles (from different individuals i.e. identical twins)	238

EXPLANATORY NOTES

Offender "Hit": A DNA profile developed from crime scene evidence and entered in the Crime Scene Index of the NDDB matches a DNA profile in the Convicted Offenders Index.

Forensic "Hit": A DNA profile developed from crime scene evidence and entered in the Crime Scene Index of the NDDB matches another crime scene DNA profile in the Crime Scene Index.

Offender Duplicate: Cases where two biological samples from the same person were submitted to the NDDB.

Identical DNA Profiles: Profiles of identical twins.

Convicted Offender's Profile: A DNA profile from an offender convicted of a designated offence (see Appendix A).

Crime Scene Profile: A DNA profile developed from biological evidence found at a crime scene.

Samples Received versus Profiles Contained in the Convicted Offenders Index: As of March 31, 2014, the NDDB had received 316,309 biological samples, of which 288,660 DNA profiles were contained in the Convicted Offenders Index. The difference of 8.7% can be attributed to rejected samples, duplicate samples, biological samples in the process of being treated and profiles removed from the Convicted Offenders Index because of a discharge, the retention period had expired, or the conviction or the order/authorization was quashed on appeal.

TABLE 3 – DNA PROFILES CONTAINED IN THE NDDB

Convicted Offenders Index	288,660
Crime Scene Index	94,246
TOTAL	**382,906**

Note: The NDDB receives 500–600 convicted offender samples per week.

TABLE 4 – BREAKDOWN OF PROFILES CONTAINED IN THE CRIME SCENE INDEX

Centre of Forensic Sciences (Toronto and Sault Ste. Marie)	34,218
Laboratoire de sciences judiciaires et de médecine légale (Montréal)	30,086
RCMP Forensic Science and Identification Services (Halifax, Ottawa, Edmonton, Vancouver)	29,942
TOTAL	**94,246**

TABLE 5 – BREAKDOWN OF CONVICTED OFFENDER SAMPLES RECEIVED ACCORDING TO CATEGORY AND OFFENCE TYPE

DNA Data Bank Orders	311,318
Retroactive Authorizations	4,991
TOTAL	316,309
Primary	167,714
Secondary	145,912
Other	2,683
TOTAL	316,309

Note: The "Other" category includes samples submitted following conviction for a non-designated offence or without a court order. These samples are not processed unless the NDDB receives a corrected order.

EXPLANATORY NOTES

Convicted Offenders Index: A post-conviction database composed of two categories of samples:

1. DNA Data Bank Orders: Includes DNA samples collected from offenders who are convicted of an offence committed at any time, including before June 30, 2000, if the offence is a designated offence when the person is sentenced or discharged.
2. Retroactive Authorizations: A biological sample taken from an offender who was

found guilty of a designated *Criminal Code* offence before June 30, 2000 and who had been:

a. Declared a dangerous offender under Part XXIV of the *Criminal Code*;

b. Declared a dangerous offender or a dangerous sexual offender under Part XXI of the *Criminal Code*;

c. Convicted of murder;

c.1. Convicted of attempted murder or conspiracy to commit murder or to cause another person to be murdered and is currently serving a sentence of imprisonment for that offence;

d. Convicted of a sexual offence within the meaning of subsection 487.055(3) of the *Criminal Code* and is currently serving a sentence of imprisonment for that offence; or

e. Convicted of manslaughter and is currently serving a sentence of imprisonment for that offence.

As of March 31, 2014, approximately 6,244 offenders qualified for inclusion in the retroactive category as defined by Bills C-3 and C-13/C-18. From this list of qualified offenders, 6,135 files were concluded with the remainder being prepared by the Attorneys General for court applications.

Primary and Secondary Offences:
See Appendix A.

TABLE 6 – CONVICTED OFFENDER SAMPLES RECEIVED BY PROVINCE/TERRITORY

British Columbia	37,709
Alberta	33,656
Saskatchewan	13,421
Manitoba	19,032
Ontario	139,316
Quebec	51,507
New Brunswick	3,979
Nova Scotia	8,331
Prince Edward Island	791
Newfoundland & Labrador	4,584
Yukon	506
Northwest Territories	1,836
Nunavut	1,641
TOTAL	**316,309**

Note: The above information represents the convicted offender samples received and is not reflective of the number of convictions eligible for inclusion into the Convicted Offenders Index.

TABLE 7 – TYPE OF SAMPLES RECEIVED FROM CONVICTED OFFENDERS

Blood	312,191
Buccal	3,823
Hair	295
TOTAL	**316,309**

TABLE 8 – BREAKDOWN OF CONVICTED OFFENDER SAMPLES RECEIVED

Adult Offender	277,323
Young Offender	38,917
Military Offender	69
TOTAL	**316,309**

TABLE 9 – CONVICTED OFFENDERS INDEX BREAKDOWN BY OFFENCE

Assault	193,826
Sexual Offence	59,278
Break and Enter	45,654
Robbery	39,480
Controlled Drugs and Substances Act	25,959
Homicide	8,189
Other	34,007
TOTAL	**406,393**

NOTE: More than one offence may be associated with a sample.

SAMPLE REJECTIONS

The NDDB has rejected only 4,548 (1.4%) of the samples it has received to date. Reasons for rejection include: offender convicted of a non-designated offence, inadequate biological samples, use of inappropriate collection kit, missing/invalid order and others. More than 53.4% of the samples rejected were collected from offenders convicted of non-designated offences and are therefore not eligible for inclusion in the Convicted Offenders Index. More than 27.0% of the samples rejected were collected from offenders using an inappropriate collection kit.

COLLECTION OF ADDITIONAL BODILY SUBSTANCES

In some instances, bodily substances have to be taken a second time, pursuant to a re-sampling authorization issued under subsection 487.091(1) of the *Criminal Code* which provides for an application for re-sampling when the original sample submitted is rejected. If the quality of the biological sample submitted is deemed inadequate for DNA analysis or if it had not been transmitted in accordance with the *DNA Identification Regulations*, the sample is rejected. Since June 30, 2000, the NDDB has received 847 samples that were taken under this provision.

EXPLANATORY NOTES

Assault: includes assault with a weapon or causing bodily harm, aggravated assault, assaulting a peace officer, overcoming resistance to commission of offence, criminal harassment and uttering threats.

Break and Enter: includes break and enter with intent, being unlawfully in a dwelling-house, break and entering a place other than dwelling-house and possession of break-in instruments.

Robbery: includes robbery and extortion.

Sexual Offence: includes rape, sexual intercourse with a female under 14 and between 14 and 16, sexual intercourse with the feeble-minded, sexual interference, invitation to sexual touching, sexual exploitation, incest, bestiality, child pornography, indecent acts, offence in relation to juvenile prostitution, sexual assault with a weapon, aggravated sexual assault, sexual assault, indecent assault, gross indecency, prostitution and luring a child.

Homicide: includes manslaughter.

Controlled Drugs and Substances Act: includes possession for the purpose of trafficking, import or export of a controlled substance, trafficking and production of substances. In 2008, Canadian legislation changed to allow DNA samples to be collected from offenders sentenced for a range of less serious criminal offences, including convictions under the *Controlled Drugs and Substances Act* (CDSA). Since January 1, 2008, the enabling changes in legislation for CDSA offences alone allowed for the collection of 25,959 DNA samples. So far, these samples have resulted in 861 convicted offender hits that have assisted in the investigation of 99 murders and 110 sexual assaults.

The Other category includes: using explosives, causing death by criminal negligence, causing bodily harm by criminal negligence, causing bodily harm with intent, dangerous operation causing death, failure to stop at the scene of an accident, impaired driving causing death, unlawfully causing bodily harm, kidnapping, hostage taking, mischief causing danger to life, arson (disregard to human life), setting fire to other substance, arson (own property), firearms, fraud, counterfeiting, criminal organization, escape, flight, theft over $5,000, forgery, disguise and intimidation.

TABLE 10 – BREAKDOWN OF BIOLOGICAL SAMPLES DESTROYED AND DNA PROFILES REMOVED FROM THE CONVICTED OFFENDERS INDEX

	ADULT	YOUNG PERSON
Conditional discharge	5,684	713
Conviction quashed on appeal	464	18
Absolute discharge	307	48
Duplicate sample (same order)	300	22
No suitable DNA profile obtained	78	12
Order/authorization quashed	29	7
Retention period expired	N/A	2,027
Other	44	9
TOTAL	**6,906**	**2,856**

N/A: Not applicable.

TABLE 11 – ENDORSEMENTS RECEIVED BY PROVINCE/TERRITORY

British Columbia	9,438
Alberta	7,192
Saskatchewan	1,261
Manitoba	3,650
Ontario	42,253
Quebec	7,223
New Brunswick	102
Nova Scotia	1,066
Prince Edward Island	18
Newfoundland & Labrador	448
Yukon	99
Northwest Territories	278
Nunavut	212
TOTAL	**73,240**

Note: The data associated with Endorsements is from January 1, 2008 through March 31, 2014.

TABLE 12 – BREAKDOWN OF ENDORSEMENTS RECEIVED

Adult Offender	69,916
Young Offender	3,323
Military	1
TOTAL	**73,240**

ENDORSEMENT

Section 487.071 of the *Criminal Code* requires police officers to verify with the Canadian Police Information Centre whether a convicted offender's DNA profile is already in the NDDB prior to executing every new DNA data bank order or authorization. If the DNA profile of an offender is contained in the Convicted Offenders Index of the NDDB, police officers may not take the bodily substances from the offender but are required to submit the un-executed DNA data bank order or authorization with an endorsement form confirming they have been advised that the person's DNA profile is already contained in the NDDB, along with the offender's fingerprints to the NDDB. The purpose of the endorsement process is to ensure that an offender's DNA profile remains in the NDDB if:

- The conviction for which the original DNA order was made is quashed on appeal; or
- The original Order/Authorization is quashed on appeal; or
- The retention period has expired because the person was either:
  - Convicted as a young person; or
  - Discharged under Section 730 C.C. of a designated offence.

TABLE 13 – ENDORSEMENT BREAKDOWN BY OFFENCE

Assault	47,176
Break and Enter	14,782
Robbery	9,653
Controlled Drugs and Substances Act	6,701
Sexual Offence	4,133
Homicide	729
Other	14,476
TOTAL	**97,650**

Note: More than one offence may be associated with a sample.

ENDORSEMENT REJECTIONS

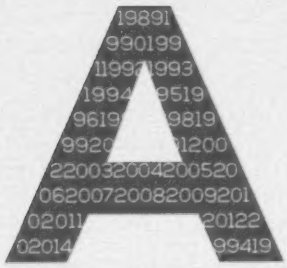
The NDDB has rejected only 1,089 (1.5%) of the endorsements it has received to date. Reasons for rejection include: DNA profile from the offender is not contained in the Convicted Offenders Index, offender convicted of a non-designated offence and others. More than 55.5% of the endorsements rejected were collected from offenders convicted of non-designated offences.

FINANCIAL STATEMENT

APRIL 1, 2013–MARCH 31, 2014

EXPENDITURE TYPE	EXPENDITURE ($ THOUSANDS)
Personnel	2,210
Internal Services	376
Employee Benefit Plan	517
Transport and Telecommunications	3
Development and Infrastructure Support	21
Rentals	3
Repair and Maintenance	25
Utilities, Materials and Supplies	1,364
Capital and Minor Equipment Purchases	422
Miscellaneous	10
SUB-TOTAL	4,951
Indirect Costs[1]	288
TOTAL	5,239

[1] Indirect Costs include: Forensic Science and Identification Services administrative and corporate support, Research and Development, recruitment, the Quality Assurance Program, IT support and the National DNA Data Bank Advisory Committee.



APPENDIX A: DEFINITIONS OF DESIGNATED OFFENCES

PRIMARY COMPULSORY OFFENCES

This category includes offences for which the court is compelled to make an order such as murder, manslaughter, aggravated sexual assault, sexual assault, child pornography and robbery. For a complete list of offences that fall under this category, refer to paragraph (a) under the definition of "primary designated offences" in section 487.04 of the *Criminal Code*.

PRESUMPTIVE PRIMARY OFFENCES

For these offences, the court shall make an order unless the offender convinces the court that the impact of such an order on his/her privacy and security of the person is "grossly disproportionate" to the public interest in the protection of society and the proper administration of justice. Examples of offences included in this category are: breaking and entering a dwelling-house and hostage taking. For a complete list of offences that fall under this category, refer to paragraphs (a.1) to (d) under the definition of "primary designated offence" in section 487.04 of the *Criminal Code*.

LISTED SECONDARY OFFENCES

For these offences, the court may, on application by the prosecutor, make an order if it is satisfied that it is in the best interests of the administration of justice to do so. Examples of offences included in this category are: breaking and entering a place other than a dwelling-house, assault and indecent acts. For a complete list of offences that fall under this category, refer to paragraphs (c) and (d) and subparagraph (e)(ii) under the definition of "secondary designated offence" in section 487.04 of the *Criminal Code*.

GENERIC SECONDARY OFFENCES

For these offences, the court may, on application by the prosecutor, make an order if it is satisfied that it is in the best interests of the administration of justice to do so. All the other non-listed *Criminal Code* offences, including certain *Controlled Drugs and Substances Act* offences that are prosecuted by indictment for which the maximum punishment is imprisonment for five years or more, fall under this category of offences. Examples of offences included in this category are: possession of explosive without lawful excuse, pointing a firearm, dangerous driving, dangerous driving causing bodily harm, causing death by criminal negligence, theft over $5,000, and drug related offences (e.g. trafficking and possession for the purpose of trafficking, importing and exporting and production of substances) which fall under sections 5, 6 and 7 of the *Controlled Drugs and Substances Act*. For more information, refer to paragraphs (a) and (b) and subparagraph (e)(i) under the definition of "secondary designated offence" in section 487.04 of the *Criminal Code*.

APPENDIX B: CHRONOLOGY OF DNA LEGISLATION IN CANADA

1995	JULY	Bill C-104 receives Royal Assent. The bill amends the *Criminal Code* and the *Young Offenders Act* to enable judges to issue a warrant allowing police to obtain DNA evidence from suspects in criminal investigations. This is Phase I of the Government of Canada's DNA Strategy which provided the legislative framework for the use of DNA evidence in criminal proceedings.
1996	JANUARY	Phase II of the Government of Canada's DNA Strategy begins with nation-wide consultations for the establishment of a national DNA data bank.
1998	DECEMBER	Bill C-3 (Statutes of Canada 1998, c. 37) receives Royal Assent. Work begins with an 18-month schedule to establish the NDDB.
1999	NOVEMBER	Bill S-10 is tabled in the Senate. Based on Senate recommendations, the Bill contains amendments to Bill C-3 including: the taking of fingerprints for identification purposes, the inclusion of offenders convicted of designated offences in the military justice system, and a full legislative review of the DNA legislation and NDDB to be conducted by the Senate and House of Commons after five years.
2000	MAY	Partial proclamation of Bill C-3 which established the DNA Data Bank Advisory Committee by Regulations.
2000	JUNE	Full proclamation of Bills C-3 and S-10. DNA sample collections are to commence immediately following proclamation.

2005	MAY	Royal Assent of Bill C-13 (Statutes of Canada, 2005, c. 25). Amendments to expand the retroactive scheme, to clarify the NDDB DNA profile sharing procedures with forensic laboratories, and to establish procedures to confirm the validity of NDDB orders coming into force on Royal Assent. Other provisions of the Bill will come into force on proclamation.
2007	JUNE	Royal Assent of Bill C-18 (Statutes of Canada 2007, c. 22). Amendments to facilitate the implementation of Bill C-13, and: • further expand the retroactive scheme to include attempted murder and conspiracy, and replace the "is serving a sentence of two years or more" requirement with "is on the date of the application serving a sentence of imprisonment" for that offence; • allow for NDDB orders to be made within 90 days after the person is sentenced or found not criminally responsible on account of mental disorder; • allow a person to be summoned for the execution of a NDDB order and penalties for failure to appear; • clarify international NDDB DNA profile sharing procedures; and, • clarify destruction procedures for defective orders.
2008	JANUARY	Full proclamation of Bills C-13 and C-18.
2009	JUNE	Parliamentary Statutory Review of the DNA legislation and NDDB by the House of Commons Standing Committee on Public Safety and National Security (SECU Report, June 2009) and government acceptance in principle of the SECU Report's recommendations in October 2009.
2009	OCTOBER	Full proclamation of Bill C-14 (Statutes of Canada 2009, c. 22). The Bill amended the *Criminal Code* by adding three offences to the list of primary compulsory offences.
2010	JUNE	Parliamentary Statutory Review of the DNA legislation and NDDB by the Senate Standing Committee on Legal and Constitutional Affairs (Report–June 2010). The Government response in December 2010 noted that recommendations requiring legislative change are "in broad agreement" with those made by SECU and that operational recommendations would require broader discussion.
2010	JUNE	Proclamation of Bill C-268 (Statute of Canada 2010, c. 3). The Bill amended the *Criminal Code* by adding one offence to the list of primary presumptive offences.

2011	APRIL	Proclamation of Bill S-2 (Statutes of Canada 2010, c. 17). The Bill amended the *Criminal Code* to make DNA sampling mandatory for convicted sex offenders and added six offences to the list of primary offenses (4 compulsory and 2 presumptive). Convicted sex offenders must also be registered in the National Sex Offender Registry.
2012	AUGUST	Proclamation of Bill C-10 (Statute of Canada 2012, c. 1). The Bill amended the *Criminal Code* by adding two offences to the list of primary compulsory offences.
2013	JULY	Proclamation of Bill S-7 (Statutes of Canada 2013, c. 9). The Bill amended the *Criminal Code* by adding four offences to the list of primary presumptive offences.